

application. Claim 9 has been canceled, without prejudice, and replaced with new Claims 16-19 which have been added to more particularly point out and distinctly claim the invention. The subject matter of the new claims is fully supported in the specification and claims as originally filed.

In particular, the new claims encompass methods for the inhibition of transmission of hepatitis B virus to a cell and methods for neutralizing hepatitis B virus in a host. Each of the claimed methods comprises the administering of a hepatitis B virus peptide recognized by the sequence search motifs disclosed in the specification. Support for the new claims can be found in Figure 52 (hepatitis B peptides) and Section 22 of the specification. No new matter is introduced by the amendments. Entry of the foregoing amendment is respectfully requested.

1. THE INVENTION

The invention relates to peptides corresponding to a domain of viral proteins discovered by the Applicants and referred to as a "DP178 and DP107-like" domains. The peptides of the invention exhibit anti-viral activity, believed to result from inhibition of viral induced fusogenic events. The peptides of the invention have amino acid sequences corresponding to the DP178 and DP107-like domains of different viruses--the sequences can be identified using a computer associated search motifs, including the ALLMOTI5, 107x178x4 and PLZIP search motifs. The pending claims relate to hepatitis B virus DP178 and DP107-like peptides, and methods

for using such peptides to inhibit hepatitis B virus transmission to uninfected cells.

The claimed methods of the invention utilize peptides having amino acid sequences, as shown in Figure 52 of the instant specification. These peptides may exhibit specific well known modifications, as recited in the claims.

The invention is described and demonstrated by way of working examples, including the working example presented in Section 22, in which computer-assisted identification of DP178/DP107 like hepatitis B peptides are identified (Figure 52A-B). In addition, the Examples presented in Sections 17, 18, 26 and 27 demonstrate that viral sequences identified via the motif searches have substantial antiviral characteristics.

**2. THE REJECTIONS UNDER 35 U.S.C. §112,
FIRST PARAGRAPH, SHOULD BE WITHDRAWN**

Claim 9, covering a method for inhibition of viral transmission to a cell is rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement. In particular, the Examiner contends that the specification does not reasonably provide enablement for any peptides from any organism or virus. The Examiner alleges that Applicants have shown that particular peptides from HIV-1 gp41 can have some antiviral effect, but this cannot be extended broadly to any peptide from any virus. According to the Examiner there is no guidance in the specification as to which proteins or peptides that are included in the immense number of peptides which fall within the search motifs that would inhibit viral infection.

Applicants have canceled Claim 9 and replaced it with new Claims 16-19. The new claims specifically encompass methods for inhibiting hepatitis B virus transmission to a cell and methods for neutralizing hepatitis B in a host. The claimed methods utilize hepatitis B virus peptides identified using the disclosed computer-associated search motifs.

The test for enablement is whether one reasonably skilled in the art could make or use the invention, without undue experimentation, from the disclosure in the patent specification coupled with information known in the art at the time the patent application was filed. U.S. v. Telectronics Inc. 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988).

The present invention covered by Claims 16-19, is based on the discovery of hepatitis B derived polypeptides, identified by utilizing the computer-associated search motifs (Sections 9, 12, and 19 of the specification) disclosed and claimed. In addition, the specification demonstrates that DP178-like viral peptides from viruses other than HIV-I exhibit a potent anti-viral activity (see Sections 17, 18, 26 and 27 of the specification). Applicants assert that armed with this teaching in the specification, including (i) methods for identifying DP178 and DP107-like hepatitis B peptides utilizing the disclosed computer search motifs; and (ii) assays that may be utilized to test the antiviral activity of such peptides (Section 22 of the specification), one skilled in the art could make and use the presently claimed invention without undue experimentation. Therefore, the invention is enabled.

While some experimentation may be necessary to determine the exact antiviral activity of any single specific hepatitis B peptide of the invention, such experimentation, given the teaching provided by the instant specification, can not be deemed undue. Enablement is not precluded even if some experimentation is necessary. Hybritech, 802 F.2D at 1384. This is even so if the amount of experimentation required is laborious. In re Wands, 858 F.2d 731 (Fed. Cir. 1988). Thus, the pending claims fully covering methods for inhibiting hepatitis B transmission and neutralization of hepatitis B which utilize such peptides are fully enabled within the meaning of 35 U.S.C. §112.

In view of the foregoing amendments and remarks, the applicants request withdrawal of all rejections under 35 U.S.C. §112, first paragraph.

3. THE REJECTIONS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH, SHOULD BE WITHDRAWN

Claim 9 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. According to the Examiner, the sequence of the search motif should be inserted into the claims because identifying it by name only may be confusing. The Examiner suggests that the sequence of the search motif be added to the claims.

With regard to the Examiner's comments concerning the search motifs, Applicants respectfully submit that they are claiming methods which utilize hepatitis B peptides identified

by the search motifs, not the search motifs themselves. The specification clearly defines each of the sequence search motifs, i.e., the ALLMOT15, 107x178x4 and PLZIP to be used for identification of hepatitis B peptides. For example, the Examiner's attention is directed to page 44, line 25 through page 47, line 5 of the specification which defines each of the search motifs. Therefore, one skilled in the art would readily be able to ascertain those peptides encompassed by the pending claims.

**4. PROVISIONAL OBVIOUSNESS-TYPE DOUBLE
PATENTING REJECTIONS**

Claim 9 is provisionally rejected under patenting as claiming the same invention as that of Claims 9-15 of co-pending application Serial No. 08/470,896. The provisional rejection of Claim 9 is obviated by the cancellation of that claim.

CONCLUSION

Entry of the foregoing amendments and remarks into the file history of the above-identified application is respectfully requested. Applicants believe that the foregoing amendments and remarks place the claims in condition for allowance. Withdrawal of all rejections and reconsideration

of the amended claims is requested. An allowance is earnestly sought.

Respectfully submitted,

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Reg No-P 41,328

Date July 28, 1997

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